

**Claims:**

1. Waste heat boiler for a Claus system, having

a steam generator chamber surrounded by a pressure-resistant mantle (14),

a long tube bundle (18) of heat exchanger tubes, which extend through the steam generator chamber and are inserted into tube plates (19) that delimit the steam generator chamber, at both ends,

at least one additional tube bundle (20) of shorter heat exchanger tubes, which are also inserted into the tube plate (19) at their exit-side end, and open into an in-flow chamber (21) at their entry-side end, and

a head piece (22) that follows the tube plate (19) at the exit-side end and is subdivided into sections,

whereby a hot process gas that exits from a combustion chamber (2) flows through the long tube bundle (18), whereby the in-flow

chamber (21) is disposed within the steam generator chamber, and has a cooler process gas (10) from a catalyst stage (4) of the Claus system applied to it, whereby a tube bundle (18, 20) is assigned to each section of the head piece (22), in each instance, and whereby devices for conducting condensed sulfur away are connected to the sections.

2. Waste heat boiler as recited in claim 1, characterized in that a head piece having a connecting flange for a direct attachment to the combustion chamber or to a splitting reactor that contains the combustion chamber is connected with the inlet-side tube plate.

3. Waste heat boiler as recited in claim 1 or 2, characterized in that the in-flow chamber (21) has a mantle-side gas inlet for the process gas.

4. Waste heat boiler as recited in claim 1 or 2, characterized in that the in-flow chamber (21) is subdivided into in-flow chamber sections (21a, 21b), whereby the in-flow chamber

sections (21a, 21b) have a mantle-side gas inlet for the process gas from a catalyst stage of the Claus system, in each instance.

5. Waste heat boiler as recited in one claims 1 to 4, characterized in that the position of the in-flow chamber (21) is coordinated with the temperature profile that occurs within the heat exchanger tubes of the long tube bundle (18), in such a manner that the temperature differences between the in-flow chamber (21) and the local temperature of the process gas passing through the long tube bundle (18) are less than 150°C.

6. Waste heat boiler as recited in one of claims 1 to 5, characterized by an additional tube (24) for hot process gas that is passed through the steam generator chamber, and a device (25) for controlling the amount of process gas flow through the additional tube (24), provided on the out-flow side, whereby the process gas also exits from the additional tube (24) at a high temperature, and can be used for heating the process gas stream, which has been cooled to a temperature below the condensation temperature of sulfur.